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## PORTABLE BOAT MOORING SYSTEM AND METHOD

## BACKGROUND OF THE INVENTION

## 5 1. Field of the Invention

The present invention relates to portable boat mooring systems. In particular, the present invention relates to portable boat mooring systems which move in response to changing water levels.

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## 2. Description of the Related Art

Tidal waters regularly rise and fall as the tide changes from high tide to low tide, causing boats to rise and fall as well. If a boat is moored with a static mooring system, the boat must be tied with sufficient loose line to account for the changing tide. This slack line can allow the boat to collide with the piling. While a floating dock can solve this problem, such a dock is not always available.

Several previous systems have been designed in an attempt to reduce or alleviate the risk of damage to boats moored in tidal waters. In one system a rigid arm is pivotally connected to a dock with the other end having a connector to be connected to the boat or ship for docking and mooring purposes. The rigid connecting arm is difficult to attach to a boat, while the boat is violently rocking in turbulent water. Most of the previous devices consist of latching mechanisms at the connector end which would appear to be difficult to attach to a boat in rough waters and appears to create a risk of possibly smashing the rigid arm mechanism through the hull of the boat or create the possibility of injuring the person trying to connect the mechanism in rough waters. Another drawback in the previous systems is that in incorporating a rigid arm mechanism, you must reach well out from the dock in order to connect the mechanism. This may create a possible dangerous situation for the operator of the equipment as well. Another

disadvantage of the previous system is that it does not allow sufficient movement of the attachment arm to accommodate the rise and fall of the water level in bodies of water.

U.S. Patent No. Re. 27,050 shows a complex mooring system which requires  
5 modifications to the pier and boat and requires a specialized mooring cable.

U.S. Patent No. 4,480,576 shows another complex mooring system which  
requires modifications to the pier. Additionally, this system includes a rolling  
carriage system to allow for changing tides.

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U.S. Patent No. 5,050,521 shows a relatively complex mooring system. This  
system uses an array of rollers and a complex mooring tie down arrangement. The rollers  
permit the mooring line to rise and fall with the tide by rolling up and down the piles.

U.S. Patent No. 5,937,781 shows an attachment for a piling which cushions  
15 the impact if a boat strikes the piling..

Therefore, there has been and continues to be a need for an easy-to-use,  
practical and portable mooring system that can be easily and conveniently used and  
20 retrofit to standard mooring lines.

## SUMMARY OF THE DISCLOSURE

A boat mooring system is described which includes rolling elements and  
25 spacing elements, each of which has an aperture. The elements are preferably made  
from a water resistant material which is resistant to damage caused by ultraviolet  
light. The rolling elements should be durable and impact resistant; materials such as  
polyethylene, nylon and plastic are appropriate. To prevent damage to the mooring  
line, the inside surface of the rolling elements is preferably tapered. The spacing  
30 elements are preferably made from a flexible material such as polyvinyl chloride  
hose. The rolling elements and spacing elements are alternately placed on a mooring  
line by means of the aperture in each element. Preferably, the rolling and spacing

elements are held in place along the mooring line by stops such as a knot located on either edge of the outside elements. The mooring line is then connected to a piling by knotting, a carabiner or other appropriate means.

5           A method for mooring a boat is described in which a stop, such as a knot, is placed near the end of a mooring line to be attached to the piling. A spacing element having an aperture is then threaded onto the mooring line and placed adjacent to the stop on the long portion of the rope. Subsequently, a rolling element, also having an aperture, is placed on the mooring line directly adjacent to the first spacing element.

10   Additional spacing and rolling elements are threaded onto the mooring line until sufficient line is covered to surround the piling. A second stop is placed on the mooring line in such a manner that the spacing elements and rolling elements are held substantially in place along the mooring line. The portion of the mooring line covered by the rolling elements and the spacing elements is placed around the piling and

15   connected by knotting or by a carabiner. As described above, the rolling and spacing elements are preferably made from a water resistant material which is resistant to damage caused by ultraviolet light. The rolling elements must be durable and impact resistant; materials such as polyethylene, nylon and plastic are appropriate. To prevent damage to the mooring line, the inside surface of the rolling elements is

20   preferably tapered. The spacing elements are preferably made from a flexible material such as polyvinyl chloride hose.

25           It is therefore an object of the present invention to provide a boat mooring system which protects boats from damage in tidal waters.

          It is another object of the present invention to provide a boat mooring system which can be used on existing pilings with existing mooring lines.

30           It is yet another object of the present invention to provide a boat mooring system which is convenient and easy to use.

It is yet a further object of the present invention to provide a boat mooring system which is portable.

Finally, it is an object of the present invention to accomplish the foregoing  
5 objectives in a simple and cost effective manner.

## DESCRIPTION OF THE DRAWINGS

Figure 1 is a perspective view of the preferred embodiment of the present  
10 invention;

Figure 2 is a perspective view of the preferred embodiment of the present invention;

Figure 3 is a side view of the roller element of the preferred embodiment of the present invention;

15 Figure 4 is a view of outer edge of roller element of the preferred embodiment of the present invention with the internal surface shown with dashed lines;

Figure 5 is a perspective view of the spacer element of the preferred embodiment of the present invention;

20 Figure 6 is a perspective view of the preferred embodiment showing one securing mechanism;

Figure 7 is a perspective view of the preferred embodiment in use;

Figure 8 is a perspective view of the preferred embodiment in use; and

Figure 9 is a perspective view of an alternate embodiment of the invention.

## 25 Element List

- 12 roller
- 14 spacer
- 16 mooring line
- 18 central hole of roller
- 30 20 internal surface of roller
- 22 first stop

- 24     piling
- 26     second stop
- 28     knot
- 30     carabiner
- 5    32     dock line
- 34     spring line

#### DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

10           The following detailed description is of the best presently contemplated modes of carrying out the invention. This description is not to be taken in a limiting sense, but is made merely for the purpose of illustrating general principles of embodiments of the invention.

15           The present invention provides a boat mooring system which is easy to use, portable and which can be used with existing pilings. The device includes rollers and spacers which are placed on a mooring line. The mooring line is then tied to the piling and secured. When the tide changes, the rollers and spacers allow the mooring line to travel up and down the piling along with the changing vertical position with  
20   the boat.

A preferred embodiment of the mooring system is shown in the accompanying figures. Figures 1 and 2 show the arrangement of rollers 12 and spacers 14 on the mooring line 16. Specifically, the rollers 12 are generally cylindrical in shape with a  
25   central hole 18 for threading onto the mooring line 16. The rollers 12 are preferably made from a water resistant, durable material which has high impact resistance. Materials such as polyethylene, nylon and plastics are suitable. Materials with high resistance to ultraviolet light damage are particularly preferred. In the preferred embodiment, as shown in Figures 3 and 4, the internal surface 20 of the rollers 12 is

tapered to provide a smoother, less damaging contact surface for the mooring line 16. Also preferably, the side edge of the roller 12 adjacent to the tapered inner surface 20 is beveled to further reduce wear on the mooring line 16. The rollers 12 generally have an outside diameter of at least 2.75 inches (7 cm)

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The spacers 14 are shown in Figures 1, 2 and 5. The spacers 14 are preferably made from a durable, water resistant material such as polyvinyl chloride (PVC) hose. A durable material which has been coated with rubber is satisfactory. Materials with high resistance to ultraviolet light damage are particularly preferred. Additionally, a flexible material is preferred. The spacers 14 are generally 3 to 3 1/2 inches in length (7.6 to 8.9 cm), 1 to 1 1/2 inches in diameter (2.5 to 3.8 cm) and have sufficient thickness to meet the durability requirements.

The spacers 14 act to ensure that the rollers 12 remain in the appropriate location along the mooring line 16. Further, the spacers 14 prevent the rollers 12 from contacting each other, preventing damage which would be caused by constant moving contact. Finally, the spacers 14 act to protect the mooring line from the water and weather damage.

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#### Use of the Invention

As shown in figures 1 and 2, the preferred embodiment of the present invention is constructed in the following preferred manner. A first stop element 22, such as a knot, is placed on the mooring line 16 a short distance from the end of the

line which is to be connected to the piling 24. Enough line is left beyond the first stop 22 to enable connection of the end around the piling. A spacer 14 is threaded onto the mooring line 16 directly adjacent to the stop element 22. Immediately adjacent to the spacer 14, a roller 12 is threaded onto the mooring line 16. Spacers 14 and rollers 12  
5 are alternated until a sufficient number have been threaded such that the piling 24 can be surrounded. A second stop element 26 is placed on the mooring line 16 directly adjacent to the final spacer 14 or roller 12 which is threaded onto the mooring line 16. The stop elements 22 & 26 ensure that the rollers 12 and spacers 14 are maintained in a substantially fixed location. There may be some slight movement along the  
10 mooring line 16, however it is preferable that such movement be minimal. While the preferred mode of use of the invention includes placing a spacer 14 on the mooring line 16 first, directly adjacent to the first stop element 22, it is also possible to place a roller 12 on the mooring line 16 first, directly adjacent to the first stop element 22.

15 The mooring line 16 is then secured around the piling 24 either by knotting 28 as shown in Figure 2, by a carabiner 30 as shown in Figures 6 - 8 or by other appropriate means. Use of a carabiner 30 is particularly preferred as this enables quick attachment to and detachment from the piling making the system particularly useful when portability is desired. The preferred embodiment is shown in use in  
20 Figures 7 and 8. As can be seen, the portion of the mooring line 16 with the spacers 14 and rollers 12 surrounds the piling 24. The opposite end of the mooring line 16 is connected to the boat using any method known in the art. Each side of the boat can be connected to a piling 24 in the same manner. Because the mooring line 16 can travel up and down the piling 24, the boat can be tied securely and needs no slack to

allow for tidal variations. Thus, the boat is moored securely between two pilings in a manner which prevents the boat from hitting the pier.

Figure 9 shows an alternate embodiment of the present invention which can be  
5 used for neighboring boats. The mooring line 16 in between two rollers can be formed into loops for connecting to two neighboring boats. Additionally, if desired, a spring line can be formed between two spacers 14 or a spacer 14 can be cut in half with the spring line formed in between the two halves.

10 While the description above refers to particular embodiments of the present invention, it will be understood that many modifications may be made without departing from the spirit thereof. The accompanying claims are intended to cover such modifications as would fall within the true scope and spirit of the present invention.

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